AMENDMENTS

What is claimed:

1. A polarized light communication device characterized in the provision of:

a transmitter for modulating the plane of polarization of the laser light, and then emitting the result as a transmission signal; and

a receiver having a light receiving means which selectively receives light of a specific polarization state.

2. A polarized light communication device according to claim 1, characterized in that one of either the transmitter or the receiver is disposed inside a strongly dispersing medium.

3. A polarized light communication device according to claim 1, characterized in that the transmitter and the receiver are disposed in a strongly dispersing medium, and the transmitter and the receiver are disposed outside the strongly dispersing medium.

4. A polarized light communication device according to claim 2 or 3, characterized in that the strongly dispersing medium is a living body.

5. A polarized light communication device according to claim 2 or 3, characterized in that the strongly dispersing medium is a human body.

Sub B2 6. A polarized light communication device according to claim 1, characterized in that:

an internal transmitting/receiving device consisting of the transmitter and the receiver is disposed inside a strongly dispersing medium;

an external transmitting/receiving device consisting of the transmitter and the receiver is disposed outside the strongly dispersing medium; and

communication is carried out between the internal transmitting/receiving device and the external transmitting/receiving device.

7. A polarized light communication device according to claim 1, characterized in that:

an internal transmitting/receiving device is disposed in a strongly dispersing medium, the internal transmitting/receiving device consisting of the transmitter and a light quantity receiver which has a received light quantity detecting means which outputs a signal in response to the received light quantity;

an external transmitting/receiving device is disposed outside the strongly dispersing medium, the external transmitting/receiving device consisting of the receiver and a light intensity transmitter which modulates the amount of light emitted and emits it as a transmission signal; and

Sub B2 communication is carried out between the internal transmitting/receiving device and the external transmitting/receiving device.

8. A polarized light communication device according to claim 1, characterized in that:

an internal transmitting/receiving device is disposed inside a strongly dispersing medium, the internal transmitting/receiving device consisting of the receiver and a light intensity transmitter which modulates the amount of light emitted and emits it as a transmission signal;

an external transmitting/receiving device is disposed in the strongly dispersing medium, the external transmitting/receiving device consisting of the transmitter and a light quantity receiver which has a received light quantity detecting means which outputs a signal in response to the received light quantity; and

communication is carried out between the internal transmitting/receiving device and the external transmitting/receiving device.

9. A polarized light communication device according to ~~claims 1 through 8~~ any one of claim 1, 2, 3, 6, 7 and 8, characterized in that the transmitter is provided with:

a light emitting means which generates a plurality of planar emission laser elements having different polarized light directions on the same semiconductor substrate; and

a driving means for selectively supplying current to these planar emission laser elements.

10. A polarized light communication device according to claims 7 or 8, wherein the light source for the light intensity transmitter is a planar emission laser.

11. A polarized light communications device according to claim 9, characterized in that in the transmitter:

the driving means drives only a portion of the planar emission lasers in the light emitting means during the regular operation of the transmitter, and, when the planar emission lasers driven by the driving means are no longer in a specific state, the driving means drives planar emission lasers in the light emitting means which were not used during regular operation.

12. A array planar emission laser, characterized in that a plurality of planar emission laser elements having different polarized light directions are formed on the same semiconductor substrate.

13. A transmitter, characterized in the provision of:

a light emitting means in which a plurality of planar emission laser elements having different polarized light directions are formed on the same semiconductor substrate; and

sub B2 a driving means for selectively supplying current to the planar emission laser elements.

14. A transmitter according to claim 13, characterized in that the driving means selectively supplies current to the planar emission lasers polarized in a specific direction in association with a transmission signal.

15. A polarized light communications device for physiological use, characterized in the provision of:

a transmitter embedded in the body, the transmitter provided inside the body and modulating the polarization plane of the laser light and emitting it as a transmission signal; and

a receiver which may be attached to the body, the receiver provided outside the body and equipped with a light receiving means for selectively receiving light of a specific polarization state, a display for providing a display corresponding to the received signal of the light receiving means, and an attaching means for fixing the light receiving means to the body so that the light receiving means receives the light emitted from the transmitter embedded in the body.

16. A polarized light communication device for physiological use according to claim 15, characterized in that:

a second light receiving means is provided inside the embedded transmitter and selectively receives light in a specific polarization state; and

Sub B2 a second transmitter is provided inside the receiver attached to the body and modulates the polarization plane of the laser light and emits the result as a transmission signal to the second light receiving means;

wherein full duplex communication is carried out between the embedded transmitter and the receiver attached to the body.

17. (canceled)

Sub B3 18. (amended) A pulse wave detecting device for detecting the pulse wave based on the signal output from the signal receiving means, characterized in the provision of:

a transmitting means for emitting a specific wave;

a receiving means for receiving a wave emitted by the transmitting means, and outputting it as a signal;

a transmission path measuring means for measuring the transmission path of the wave and the cross-sectional area of an arterial vessel in the body, based on the state of reception of the receiving means;

a notifying means for notifying the user of the results of measurements by the transmission path measuring means;

a position changing means for changing the relative positional relationship of the receiving means and the transmitting means to a direction so that the receiving state improves, based on the results of measurements by the transmission path measuring means.

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19. A pulse wave detecting device characterized in the provision of:

a transmitting means for emitting a specific wave;

a receiving means for receiving a wave emitted by the transmitting means and outputting it as a signal;

a transmission path measuring means for measuring the positional relationship between the transmission path of the wave and the cross-section of the arterial vessel based on the state of the signal received by the receiving means; and

a position changing means for changing the relative positional relationship of the receiving means and the transmitting means to a direction so that the receiving state improves, based on the results of measurements by the transmission path measuring means;

wherein, the pulse wave detecting device detects the pulse wave based on the signal output from the receiving means.

20. (amended) A pulse wave detecting device according to claim 18 or 19, characterized in that:

the pulse wave detecting device is provided with a body motion component detecting means for detecting body motion components in the body where the pulse wave is being measured; and

the pulse wave is detected after removing the body motion component detected by the body motion component detecting means from the pulse wave received by the receiving means.

21. (amended) A pulse wave detecting device according to ~~one of claims 18 through 20~~ claim 18 or 19, characterized in that the wave is light.

22. (amended) A pulse wave detecting device according to ~~one of claims 18 through 20~~ claim 18 or 19, characterized in that the wave is laser light.

23. (amended) A pulse wave detecting device according to ~~one of claims 18 through 20~~ claim 18 or 19, characterized in that the wave is polarized laser light.

24. (amended) A pulse wave detecting means according to claim 18 or 19, characterized in that the pulse wave detecting device is provided with a ring-shaped attaching member that attaches to the body in which detection is being performed, and the transmitting means and the receiving means attach to the attaching member.

25. A pulse wave detecting device according to claim 24, characterized in that the attaching member wraps around the arm, with the position of the transmitting means and the receiving means and the direction of emission of the wave being set so that the transmission path passes between the radius and ulna bones in a cross section of the arm.

26. A reflected light detector characterized in the provision of:

a light emitting means for emitting light (electromagnetic wave) onto a dispersing medium;

a first polarizing means for polarizing light generated by the light emitting means;

a second polarizing means upon which the polarized light that is reflected by the dispersing medium incidents, the second polarizing means permitting passage of light components polarized in a specific direction; and

a light receiving means upon which light which has passed through the second light polarizing means incidents;

wherein, the light receiving means consists of a light resonating means for resonating the incidented light, and an outputting means for outputting a signal proportional to the light resonated by the light resonating means.

27. A reflected light detector according to claim 26 characterized in that the direction of polarization of the first and second polarizing means are the same.

28. A reflected light detector according to claim 26 characterized in that the direction of polarization of the first and second polarizing means are perpendicular or reversed with respect to one another.

29. A reflected light detector according to claim 26 characterized in the provision of a filter means for absorbing

light having a shorter than specified wavelength out of the light incidenting on the receiving means.

30. A reflected light detector for a strongly dispersing medium according to claim 26 characterized in the provision of:

a light control means for intermittently turning on and off the light which is emitted on the dispersing medium; and

a first removing means for removing the signal output from the outputting means when the light is off, from the signal output from the outputting means when the light is on.

31. A reflected light detector according to claim 26, characterized in that:

at least two sets of the second polarizing means and the receiving means are provided; and

the direction of polarization of each of the second polarizing means are set so as to be in the same direction as the direction of polarization of the first polarizing means and perpendicular to or opposite the direction of polarization of the first polarizing means, respectively.

32. A reflected light detecting means according to claim 26, characterized in that the light emitting means and the first polarizing means can emit light polarized in the same direction as the direction of polarization of the second polarizing means, and light perpendicular to or opposite the direction of polarization of the second polarizing means, respectively.

sub B3 33. A reflected light detecting means according to claim 32, characterized in the provision of:

a driving means for driving the light emitting means so that light polarized in the same direction as the direction of polarization of the second polarizing means, and light polarized in a direction perpendicular or opposite the direction of polarization of the second polarizing means are complementarily emitted; and

an extracting means for extracting the output from the outputting means for the case where the driving circuit drives the light emitting means to emit light polarized in the same direction as the direction of polarization of the second polarizing means, and for the case where the driving circuit drives the light emitting means to emit light polarized in a direction perpendicular to or opposite the direction of polarization of the second polarizing means.

34. A reflected light detector according to claim 32, characterized in that:

the light emitting means is a semiconductor laser consisting of light reflecting layers and an active layer inserted therebetween; and

the first polarizing means polarizes light from the semiconductor laser in two directions by employing a circularly shaped light reflecting layer and modulating the inrush current directed to the active layer.

35. A reflected light detector according to claim 32, characterized in that:

the light emitting means is a semiconductor laser consisting of light reflecting layers and an active layer inserted therebetween; and

the first polarizing means polarizes light emitted by the semiconductor laser by employing a rectangularly shaped light reflecting layer, and polarizing light from the dispersing medium in two directions by disposing the directions of the short legs of the light reflecting layer so that they are 90° with respect to one another.

36. A reflected light detector according to claim 26, characterized in that a semiconductor laser consisting of light reflecting layers and an active layer inserted therebetween is employed as the light emitting means.

37. A reflected light detector according to claim 26, characterized in that:

a photo diode consisting of light reflecting layers and a depletion layer inserted therebetween is employed for the light receiving means;

the light resonating means is formed of two light reflecting layers; and

the outputting means generates a current in response to the amount of light absorbed by the depletion layer.

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38. A reflected light detector according to claim 26, characterized in the that:

a semiconductor laser consisting of light reflecting layers and an active layer inserted therebetween is employed as the light emitting means;

a photo diode consisting of light reflecting layers and a depletion layer inserted therebetween is employed as the light receiving means;

the light resonating means is formed of said two light reflecting layers; and

the outputting means generates a current in response to the amount of light absorbed by the depletion layer.

39. A reflected light detector according to claim 37, characterized in that:

the light emitting means and the light receiving means are formed to the same semiconductor substrate, and are employed in a unitary or separate manner.

40. A pulse wave detecting device employed in the reflected light detector according to claim 26, characterized in that:

the light emitting means emits light on a body;

the light receiving means is incidented upon by light reflected by the body; and

the outputting means detects the pulse wave in the body.

41. A pulse wave detecting device according to claim 40, characterized in the provision of:

a body motion detecting means for detection body motion; and

a second removing means for removing the body motion component detected by the body motion detecting means from the signal output by the outputting means, and outputting the result as the pulse wave.

42. A pulse wave detecting device according to claim 40 characterized in the provision of:

a body motion detecting means for detecting body motion;

a determining means for determining whether or not the body is at rest based on the body motion component detected by the body motion detecting means; and

a third removing means for outputting the signal output by the outputting means as the pulse wave without modification when the determining means determines that the body is at rest, and removing the body motion component detected by the body motion detecting means from the signal output by the outputting means when the determining means determines that the body is not at rest, and outputting this result as the pulse wave.

43. (added) A pulse wave detecting device characterized in the provision of:

a transmitting means for emitting a specific wave;

a receiving means for receiving the wave emitted by the transmitting means and outputting it as a signal;

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a transmission path measuring means for measuring the positional relationship between the transmission path of the wave and the cross-section of an arterial vessel in the body;

a notifying means for notifying the user of the measured results from the transmission path measuring means; and

a body motion component detecting means for detecting the body motion component in the body in which the pulse wave is measured;

wherein the pulse wave detecting means detects the pulse after removing the body motion component detected by the body motion component detecting means from the wave received by the receiving means.

44. (added) A pulse wave detecting device according to claim 43, characterized in that the wave is light.

45. (added) A pulse wave detecting device according to claim 43, characterized in that the wave is laser light.

46. (added) A pulse wave detecting device according to claim 43, characterized in that the wave is polarized laser light.

47. (added) A pulse wave detecting device characterized in the provision of:

a transmitting means for emitting a polarized laser light;

a receiving means for receiving the laser light emitted by the transmitting means and outputting it as a signal;

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a transmission path measuring means for measuring the positional relationship between the transmission path of the laser light and the cross-section of an arterial vessel in the body, based on the reception state of the receiving means; and

a notifying means for notifying the user of the measured results from the transmission path measuring means;

wherein, the pulse wave detecting device detects the pulse wave based on the signal output from the receiving means.

48. (added) A pulse wave detecting device characterized in the provision of:

a transmitting means for emitting a specific wave;

a receiving means for receiving the wave emitted by the transmitting means and outputting it as a signal;

a transmission path measuring means for measuring the positional relationship between the transmission path of the wave and the cross-section of an arterial vessel in the body, based on the reception state of the receiving means;

a notifying means for notifying the user of the measured results from the transmission path measuring means; and

a ring-shaped attaching member for attaching to the body which is the target of detection;

wherein, the transmitting means and the receiving means are attached to the attaching member, and detect the pulse wave based on the signal output from the receiving means.

49. (added) A pulse wave detecting device according to claim 48, characterized in that the attaching member wraps around the arm, with the position of the transmitting means and the receiving means and the direction of emission of the wave being set so that the transmission path passes between the radius and ulna bones in a cross section of the arm.